Dot-ORG/Rwanda Final Report

Information and Communication Technologies for Elections and Community Access

(July 2002 – June 2005)

USAID Associate Award Number 623-G-00-02-00056-00

Background

From July 3, 2002 until July 2, 2005, the dot-ORG program implemented a USAID/Rwanda-funded activity called *Information and Communication Technologies for Elections and Community Access*. The dot-ORG program is implemented by the Academy for Educational Development (AED), who also served as the lead implementer of the dot-ORG/Rwanda project.[1] Other implementing partners included dot-ORG subcontractors CODE Incorporated, Geekcorps, Winrock International and Satellife. Additionally, a US-based consultant (James McKenna) provided valuable technical assistance to the project. During the course of the project, AED maintained a three-person field office team in Kigali, Rwanda, led by Mr. Gerald Mpyisi.[2]

As the project title implies, the underlying objective of this project was to use information and communications technologies (ICTs) to 1) increase people's access to technologies and information in rural and underserved areas; and 2) improve the way the Rwandan government managed its election process.

Increasing Access to ICTs

Many of Rwanda's rural areas and small towns lack affordable and reliable access to ICTs, including telephones, internet, fax, and computers. In the process, people, businesses and organizations in these areas are unable to compete effectively in the national or global economy.

To address this issue, the dot-ORG/Rwanda project was tasked to establish 2-4 locally owned- and –operated Community Internet Centers (CICs) in small towns and/or rural areas of Rwanda. It was proposed that at least one of these CICs would be established in an area without connectivity or electricity (a so-called "off-grid" area). These off-grid CICs would potentially have to use connectivity and energy-related technologies such as satellite (VSAT), wireless (WiFi), solar power, etc.

Through its work on other USAID ICT-for-development projects, AED had gained extensive experience in implementing public access IT centers ('telecenters'). AED thus proposed to apply to the specific Rwandan context lessons learned from those projects and those by other development initiatives.

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[1] The dot-ORG project is part of the DOT-COM Alliance, a USAID/EGAT/OIE-funded initiative. The dot-ORG project focuses on increasing access to and making effective use of information and communications technologies (ICTs) for development and poverty alleviation. The project includes a core group of implementing partners, headed by AED, and 63 resource partners that can be called on to help carry out projects. Please refer to http://www-dot-com-alliance.org for more information.

[2] Dot-ORG thanks the USAID/Rwanda Mission for their invaluable support and guidance during the course of the project.

As proposed in the approved project description, dot-ORG intended that the CICs would be designed around the following attributes:

- The CIC operators and sites would be selected through a transparent and open competitive national tender, in order to ensure that high-quality and committed applicants were selected;
- Entrepreneur-owned and –operated, based on best practices learned in telecenter development projects elsewhere.
- A strong focus on cost-share right from the beginning. The project would provide a relatively small amount of up front support to each of the entrepreneurs, which included the procurement of some computer equipment and furniture, alternative energy equipment, and in some cases internet connectivity equipment. Ongoing training and monitoring/evaluation would also be provided. In return, the entrepreneurs would be responsible for all recurring costs and provide the building space.
- Focus on a "hybrid" model involving fee-based services (a core commercial model) with also mandate for the CIC to offer social development services such as training and access to development content. In this way, the CICs would distinguish themselves from cybercafes by offering more valuable development-related services and also have a sustainable business model at their core;
- CICs should offer a range of both basic and more sophisticated services, as appropriate to demand, income levels, etc of the local community. This includes email, telephone, fax, photocopying, training, web page development, and assisting clients such as NGOs with converting information and training materials into different formats.
- The execution of collaborative agreements between dot-ORG and the CIC operators spelling out precise terms of responsibility and support, title of equipment, etc.
- The use of pre-paid vouchers to stimulate demand especially by users who would not normally frequent a telecenter; and
- The creation of a CIC Association to serve as an advocacy body for the CICs and other public access centers, as a hub to share lessons learned, etc.

The section below discusses the outcomes of the CIC activity based on the goals and objectives set forth in the program description.

Using ICTs to Strengthen the Election Process

dot-ORG was tasked under this activity to use ICTs to help strengthen Rwanda's election process. This entailed strengthening the capacity and effectiveness of the National Electoral Commission (NEC) of Rwanda through ICTs and related training.

The initial project tasks consisted of the following:

- Provide hardware and software to help NEC staff maintain the national voter database;
- Provide NEC staff with a mix of training opportunities to enhance their skills with developing and managing advanced databases;
- Complete the cabling for the NEC's Local Area Network (LAN);
- Assist NEC staff with developing a secure Internet platform and interface for its database to increase its efficiency, and provide easy access to data and validation;
- Help the NEC print high-quality voter registration cards through the procurement of a high-speed commercial impact printer; and
- Try a possible pilot activity using personal digital assistants (PDAs) or hand-held computers to collect, validate, and update voter registration data.

In March 2003, USAID/Rwanda requested that dot-ORG, through the provision of supplemental funding, undertake additional activities on behalf of the NEC. These additional activities included the following:

- Printing and shipping of approximately four million variable data pre-printed voter registration cards and 250,000 blank voter cards;
- Procurement of more robust and sophisticated high speed commercial printer capable of enabling the NEC to print voter registration cards on an ongoing basis, as well as supporting the NEC's other printing needs;
- Installation of networked personal computers at the NEC's 12 provincial offices as well as computer training for NEC staff in Kigali and at the provincial offices;
- Database management training for NEC;
- Support for dot-ORG resource partner Geekcorps to provide a volunteer to the NEC for several months of technical assistance and training; and
- Additional support for the PDA pilot project.

The section below highlights some of the main elements involved in the completion of these activities.

Objective of Final Report

This final report is intended to summarize, underscore and analyze some of the main issues involved in the implementation of the CIC and NEC activities, as opposed to providing a detailed description of each project activity. During the course of the project, dot-ORG has submitted detailed reports covering each of the activities mentioned above, including quarterly/annual reports, reports submitted from implementing partners, and mid-term and final evaluations by the AED field team. Rwandan and US-based media organizations have also produced articles about the program. These reports and articles are available upon request. Finally, the DOT-COM Alliance website (www.dot-com-alliance.org) has produced several articles and 'Digital Postcards' relating to the dot-ORG/Rwanda project. This website is accessible to the public.

Establishment of the Community Internet Centers (CICs)

Overview

Under the original terms of the project award, dot-ORG was tasked with establishing two CICs in secondary cities that have access to electricity, basic telecommunications, etc. Dot-ORG was also tasked with establishing one 'off-grid' CIC in a Rwandan community that lacks adequate power, telecom access, etc.[3]

In March 2003, via a competitive tender process, dot-ORG selected two applications for establishing CICs, one in the town of Nyanza and the other in the town of Gitarama. In April 2003, these CICs were established. In October 2004, via a competitive selection process, dot-ORG established an "off-grid" in the town of Nyamata. In early 2005, a fourth CIC was established in the town of Nyagatare. The CICs are operated by private entrepreneurs, one of which (the Nyagatare CIC) is owned and operated by a woman.

The final evaluation report concluded that the CICs are being managed in a sustainable and effective manner and that they are offering services consistent with the objective of making the CICs valuable development enterprises. Hence the dot-ORG/Rwanda project recommended to USAID that transfer of the equipment and furniture be made to the CIC operators at the end of the project.[4]

Some Key Issues Related to the CICs

It is of course very difficult to predict and manage for all the unexpected events and issues that may arise during the course of a development project. Indeed, these unexpected events help provide critical lessons learned and strategies for subsequent activities. The experience with the CICs is no different. Below are some of the key issues related to the CICs:

<u>Overall Prognosis – Impact and Sustainability Prospects</u>

The dot-ORGA/Rwanda field team conducted ongoing M&E of the CICs, culminating in a final evaluation report in early 2005.[5] Based on the results of the final M&E report, it is

[3] The majority of information for this section derives from a final evaluation of the CICs as written by dot-ORG/Rwanda field staff, led by Mr. Gerald Mpyisi.

[4] The Nyagatare CIC was established only a few months before the project ended; however, initial indications of that CIC's management capacity and overall sustainability prospects were favorable.

[5] In August 2005, NPR ran a radio story about ICTs in Rwanda and focused on the CIC in Nyamata. Based on the data from this radio story, it appears that at least the Nyamata CIC has continued to do well after the end of the project.

evident that at least the first three CICs that were established have been making profits and that, by and large, their revenue trajectories continue to improve.[6]

The CICs operate as a "hybrid" model whereby they offer a range of fee-based services designed to bring in revenue but also provide social development outcomes. In this respect, the CICs have been offering a range of services and programs, including computer training, language training (in the case of the Nyanza CIC), Internet services, and secretarial services. The CICs have supplemented their revenues by selling beverages. The CICs also have utilized the pre-paid voucher system to bring in clients.

The CICs have been serving a range of clients, ranging from local business people, government officials, students, tourists, and NGO staff. Anecdotal evidence suggests that the CICs have been making the following types of impacts:

- Increasing productivity for businesses (e.g. helping people save time by using email or the telephone to conduct business rather than having to go in person to Kigali or other places);
- Building the computer literacy of students, local government officials etc.;
- Enhancing collaborations between the private sector, government and the NGO community. For example, the Nyamata CIC operator is working with the NGO World Links to provide computer training for up to fifty teachers (initially in government-run schools supported by the USAID-funded World Links program).

As noted in the final CIC evaluation report, initial evidence strongly suggests that the CICs are on their way to long-term self-sustainability, that they have made a positive difference in the communities they serve, and that they have supported the Government of Rwanda's (GOR) goal (expressed in its *Vision 2020* plan) to extend high-quality ICTs out to rural areas. In this way, it is hoped that the GOR or other stakeholders might see the CIC model as a useful one in scaling up efforts to extend ICT access to other rural and underserved areas.

Nonetheless, it is recommended that a follow-on evaluation of the CICs be conducted to measure adequately their impact and sustainability prospects over the longer term. This evaluation could analyze other public access ICT centers that have also established in Rwanda, in order to do a comparative analysis of different business and operating models, see what type of model or approach was best suited for scalability, etc.

Availability of Affordable and Reliable Energy

During the time the CICs were designed, Rwanda appeared to have a relatively reliable and affordable supply of energy, including to the towns where the CICs were located. As

[6] See footnote #4 about why the fourth CIC could not be evaluated in detail. For at least some of the CICs, their revenues have been helped due to the lack of competition from other public access centers, but it is likely that this will not continue to be the case. As noted in the final CIC evaluation report, another public access center emerged in Gitarama, but the CIC entrepreneur did not evince concern, saying that his business was turning away clients because there was such demand for the CIC's services.

a result, the CICs were designed along a standard energy consumption configuration – e.g. use of CRT monitors, power backup units, no alternative energy solutions such as solar power. At the time, this configuration was consistent with other public access centers in Rwanda and, given project budgetary constraints, seen as a cost-effective configuration.

However, starting in late 2003, Rwanda began to experience serious power outages nationwide, which of course began to affect the CICs in Nyanza and Gitarama. The CICs had to close frequently which caused a decrease in clients and revenue. The Gitarama CIC purchased a generator to deal with this problem but was now faced with high recurring costs and maintenance of that generator. The challenge was then to find a more effective alternative energy solution that would enable the CICs to operate profitably.

To this end, in December 2004, through support from the dot-ORG Leader Award, Winrock International was tasked with identifying a reliable backup solution and set of potential alternative energy technologies that the CICs could use. Winrock is a dot-ORG resource partner and a recognized expert in the design and use of energy systems for rural areas. To this end, Winrock produced a comprehensive report showing different scenarios for CIC energy systems, including the use of a generator only, generator plus battery backup, etc. This report included an analysis of the potential start-up and recurring costs of each scenario. Solar power was not included, presumably because in Winrock's analysis of local solar power system capital expenditure costs, the CAPEX costs were deemed to too high.

Based on the suggestions in that December 2003 report, dot-ORG/Rwanda implemented, through Winrock and its partner ESDA (based in Nairobi), an activity to provide the CICs with battery backup solutions. These batteries would be connected to the electricity grid and would be recharged while the grid is running. The batteries would then provide emergency power to the CICs when there is a power outage. In August 2004 the battery power backup system equipment was ordered and the system was installed at each CIC in September 2004.

The backup systems have significantly improved the operations of the CICs, as the CIC final evaluation and Winrock's report on this activity shows. However, one key issue involves the capacity of the CIC managers to maintain the battery systems effectively. For example, Winrock provided training and a user manual on how the battery systems should be used (e.g. not to drain the batteries below a certain level). It appears that at least one of the operators has not followed these suggestions fully, and the battery system may suffer as a result. Thus, some follow-up training and support might be necessary to ensure integrity of the battery systems.

In addition to designing, procuring and implementing back-up power solutions for the on-grid CICs, Winrock International was also tasked to recommend low-power ICT equipment for the third CIC, established in the town of Nyamata. The Nyamata CIC does not have a generator. However, although the grid power supply in Nyamata is inadequate,

it is steady. The town gets uninterrupted power supply for at least eight hours each day (or night). This enables the CIC operator to fully charge his backup batteries. The center has low-power consumption computer equipment, including TFT flat screens (as opposed to CRT screens installed at the other two telecenters). All these factors, combined with the power management training the CIC operator received during a training workshop focused on small and medium enterprise (SME) management (see below) has enabled the Nyamata operator to operate profitably from the beginning.

In summary, and in retrospect, it is critical to design energy efficient systems right from the beginning, including the need to think about viable alternative energy systems (either as the main power source or as a backup) and to install energy efficient computer equipment. If global energy prices continue to rise, then this reliance on alternative energy technologies and low-power computing systems may be ever more important.

It should be noted that the lessons learned from this dot-ORG/Rwanda activity have played an instrumental role in broader analyses about the intersection of ICTs and energy. For example, in collaboration with Winrock, the dot-ORG Leader Award has created an ICT/energy solutions toolkit for development practitioners and operators. The toolkit is based on a comprehensive study by Winrock of ICT/energy issues and solutions. It is designed to provide extensive resources on different types of energy solutions for ICT projects and a decision-making toolkit to help users figure out the costs/benefits of different ICT/energy solutions related to their specific context. This toolkit can be accessed at www.dot-com-alliance.org/Toolkit.htm

Connectivity

Until recently, Rwanda's telecom sector was dominated by the monopoly carrier RwandaTel. Costs for internet connectivity in the CIC sites were prohibitive and reliability and availability was limited. As proposed in the original project description, dot-ORG planned to cope with this issue by partnering with satellite operator ARTEL. In this design, the CICs would be equipped with VSAT. Artel was unable and/or unwilling to partner with dot-ORG for most of the project, and thus the first two CICs were forced to use RwandaTel for their broadband connectivity. Fortunately, it appears that for the two CIC clients at least RwandaTel's prices and services have improved, and thus the two CICs appear able to sustain the recurring costs. For the third and fourth CICs, Artel was able to offer VSAT service, and by all appearances, this service is working out well.

At least two issues may have significant effect on the connectivity environment:

- As with many other telecenters worldwide, the CICs may need to try and 'share / resell bandwidth' to other clients, preferably via wireless technologies. Other telecenters are successfully using bandwidth sharing technologies to defray their costs, and thus are essentially acting like mini-Internet Service Providers (ISPs). Experience has shown that the technical ability to share bandwidth is present; the major hurdle appears to be regulatory/policy constraints and/or business

management capacity of the operators and commitment by the parties to respect contract provisions.

- The entrance of the firm Terracom, which is laying down fiber optic networks across the country. Perhaps in time the CICs will be able to tap into these networks for a lower cost and with better service/bandwidth capacity.

Business Management Training

It appears that most if not all of the CICs are operating in a sustainable manner and providing a positive impact on the communities they serve. As mentioned above, dot-ORG believes that an important reason for this was the use of a competitive tender process to ensure that well qualified and committed operators were chosen. All of these CIC operators have had prior experience with ICTs and public access centers, and this experience has of course proven helpful.

However, like many telecenter operators (and others) these CIC operators expressed a demand for and interest in receiving training in such areas as business management. dot-ORG had already identified the need for and utility of such training for these operators and given the high expressed demand, implemented a business management training activity.

To this end, the project conducted a successful training workshop in September 2004 on how to manage small and medium enterprises (SMEs), focusing especially on the management of CICs. The workshop had twelve participants, who included the CICs operators and project staff. The training was done through the computer-based learning modules developed by the IFC's SME Toolkit and provided by international consultant James McKenna. The workshop took place at a computer lab at the Kigali Institute of Science, Technology and Management (KIST).

To optimize the training course, the consultant first conducted M&E activities at the three dot-ORG CICs in order to understand their business needs, constraints, services, clients, etc. Based on evaluations of the workshop, the participants found the training very useful, in such areas as marketing, financial management, etc.[7] dot-ORG believes that this training tool is well adapted to the needs to telecenter operators and that a mix of face-face and distance learning can be highly effective in building management capacity.[8]

[7] Mr. McKenna continued to communicate directly with the CIC operators after the workshop and provide guidance on business management issues stemming from lessons learned at the workshop. No additional USAID funds were used for this continued support; it appears Mr. McKenna provided this ongoing support on a *pro bono* basis.

[8] For example, this SME Toolkit can be very useful for Last Mile Initiative (LMI) projects involving public access centers in rural and underserved areas. However, like most computer-based courses involving business or technical issues, it is recommended that some face-face training accompany the course.

The dot-ORG project has also worked to build management capacity of the CIC operators through its ongoing monitoring and evaluation activities. In this regard, the field team worked closely with the first three CIC operators on how to monitor and report on the performance of their businesses, through such means as monthly income/expenditure statements. Through the SME-related training and ongoing support from dot-ORG, the CIC operators are also able to monitor their daily energy availability and to relate it to the daily income for the business.

CIC Association

Based on lessons learned from telecenter projects elsewhere, dot-ORG/Rwanda proposed to create an association of CIC operators. Past experience has shown these associations can be helpful in encouraging the exchange of strategies and lessons learned, serving as an advocacy body for policy and regulatory issues (e.g. lobbying for more favorable Internet rates), and providing value-added fee-based services such as training, hosting conferences and exhibitions, etc. Dot-ORG emphasized the importance of member dues and long-term self-sustainability strategies when establishing this association.

In February 2004, the association of CIC operators was created. The Association is called the Information and Communications Association of Rwanda (ICTAR) and its members now include other institutions and individuals interested in ICT development in Rwanda. The dot-ORG project helped set up an online discussion forum and a website for the association. The website was launched in October 2004 though a Google search in August 2005 was unable to locate the site.

Like all associations, ICTAR will have to surmount a range of challenges in order to ensure long-term sustainability, including: stimulating sufficient demand from members to receive a steady inflow of member dues; ensuring effective management; identifying effective revenue-generating, value-added services to supplement member dues; competition from other associations and other institutions that may be engaged in the same type of activity; relatively low disposable income by the member base; etc. Follow-up monitoring and evaluation would best determine what the impact of the association has been and lessons learned for creating similar types of initiatives in the future.

Other Longer Term Issues regarding the CICs

Initial findings are positive regarding the CICs' impact and sustainability prospects. These findings show that with a relatively small amount of donor support, these types of public ICT access centers can make an important difference to their communities and remain viable entities over the longer term. Nevertheless, like all public access projects in developing countries, the CICs will probably need to address effectively several issues in addition to the issues mentioned above if they want to be sustainable over the long term. These issues, in brief, include:

- Managerial: e.g. setting aside profits to cover depreciation, client fluctuation, equipment repairs, ensuring effective pricing strategies that respond to

competitive pressures but that still deliver social benefits to the disadvantaged, continue to refine marketing strategies, dealing with staff turnover, etc.
- Technical / business: e.g. trying to resell Internet connectivity to other clients, essentially acting like a mini-Internet Service Provider (ISP), dealing with regulatory/policy changes, etc;
- Identifying, creating and disseminating valuable content to different groups (e.g. local health clinics);
- Striving for gender equity (both in terms of CIC clients and staff); and
- Encouraging the CICs to connect to other public ICT access initiatives such as the Last Mile Initiative (LMI) and to Rwandan government agencies who may want to expand the model to a national scale.

Using ICTs to Strengthen the Election Process in Rwanda

Overview

The dot-ORG/Rwanda project successfully completed a range of capacity building activities on behalf of the National Electoral Commission (NEC) of Rwanda. Specifically, dot-ORG/Rwanda[9]:

- Provided hardware and software to help NEC staff maintain the national voter database. This included a high capacity server and operating software;
- Provided NEC staff with a mix of training opportunities to enhance their skills with developing and managing advanced databases. This included both intensive basic and advanced face-face database training (through dot-ORG resource partner Geekcorps and through a trainer based in East Africa) as well as self-paced learning materials;
- Helped (through CODE Inc.) the NEC to print approximately four million personalized voter registration cards. This included CODE shipping and delivering the cards to Rwanda.
- Enabled the NEC to print high-quality voter registration cards on an ongoing basis through the procurement of a high-speed commercial impact printer; and
- Implemented (via dot-ORG resource partner Satellife) a national-level pilot activity using personal digital assistants (PDAs) to collect, validate, and update voter registration data; and
- Installed networked personal computers at the NEC's twelve provincial offices;

Analysis of dot-ORG Activities on Behalf of the NEC

[9] dot-ORG did not complete the LAN cabling for the NEC's Kigali headquarters office because the NEC had completed this work on their own. It was also determined that the creation of a "secure Internet platform and interface" for the NEC's database was not relevant or technically necessary, and the NEC did not signify objections to this determination.

Dot-ORG has learned and applied several lessons from its work with the NEC:

- Working with a government or government-related institution like the NEC in a developing country on a large-scale ICT activity requires a high degree of flexibility and adaptability. For example, dot-ORG is gratified by data indicating that the production of the personalized voter cards played an important role in helping the NEC manage its elections more effectively. This data indicates that the NEC had to undertake a significant internal effort to update its databases at the provincial and local level in order to provide the basis for the cards to be printed. Nevertheless, this process involved multiple delays in producing a final updated database, in part because the NEC was so occupied trying to manage several upcoming national elections and referenda. These delays in turn affected the production and shipping schedule of the voter cards.

- An innovative field-based activity such as the PDAs requires strong organizational capacity and a strong "backend" infrastructure capable of supporting the PDA applications and data exchange process. It is highly unlikely that the national-level PDA activity would have been so successful if the NEC's main voter database was inadequate. Similarly, the NEC's headquarters' success in working with the provincial offices provides a critically important platform for "hotsynching" the PDAs from the field to the main database in Kigali. Finally, on this topic, the considerable amount of database training provided to the NEC's IT staff was essential for them to work with Satellife to design a user-friendly interface on the PDA and to load the voter registration information on the PDAs.

- As Satellife's final report on the PDA indicates, the NEC was enthusiastic about the results of the PDA trial, while being mindful of the challenges toward widespread deployment (e.g. power availability issues). The NEC's commitment to send its staff for further training on the PDAs at their own cost is also a reassuring sign of the Commission's intent to carry on and expand the activity. Nonetheless, a relatively sophisticated ICT activity such as the PDAs may require some additional technical assistance in order to ensure the NEC successfully deploys the PDAs and makes them an integral part of the Commission's work. Moreover, extensive and objective monitoring and evaluation is required to fully understand the costs and benefits of using such a system over more traditional paper-based methods.

- The NEC has undoubtedly benefited from a range of capacity building initiatives by different donor agencies so it is difficult to measure the direct impact of dot-ORG's work on the Commission. Yet it can be argued that such interventions as the database training, production of personalized voter cards, networking the NEC's provincial offices, and implementing the PDA pilot have played significant roles in improving the NEC's operations and its vision for what is possible through ICTs. In this regard, other neighboring countries, such as the Democratic Republic of Congo (DRC), could also benefit from these types of interventions. For example, DRC has suffered from many of the same types of

political, social and economic factors as Rwanda, and the need for free, transparent and well managed elections is vital to its emergence as a more democratic and better governed state.

Conclusion

Dot-ORG believes that the major objectives of the project have been successfully completed. In terms of the CIC activity, the project catalyzed the creation of sustainable public access centers in rural and underserved areas that have helped small businesses and provided important information, knowledge and skills for a wide range of constituents (e.g. students, local government officials). In this way, it appears that the CIC model is one that might be feasibly scaled up to a wider level. The project also identified and implemented innovative solutions to complex energy problems, and the lessons learned from that activity should be of great value to other related development issues worldwide.

Through the technical assistance activities with the NEC, dot-ORG believes it established an effective working relationship with the Commission and strengthened its capacity in a variety of ways. In turn, it can be argued that the database management and training support plus the creation of four million personalized voter registration cards has and will continue to play a helpful role in improving the electoral process, and, hopefully, to Rwanda's path to more effective democratic governance more broadly. Equally, the PDA pilot activity yielded valuable new lessons on the use of handheld devices for improving democratic reform and governance, and it is hoped that this type of activity can and will be replicated elsewhere where appropriate.